1. Explain in writing what is a virtual machine

   A virtual machine is a way to run any type of operating system by using hardware emulation to create a virtual computer within an existing operating system environment. The machine running the virtual machine is called the host and the VM is called the guest operating system. The guest machine thinks that it is a completely different computer and uses the host machine's resources.

2. Explain in writing at least 4 things that all operating systems have in common

   The 4 things that all operating systems have in common are they provide process management, memory management, file system management, and Security and access control.

3. Explain in writing the difference between the three kernel types

   Monolithic kernels almost everything runs in privileged mode. In monolithic mode, the kernel controls everything except for the application, so it controls the file system, system calls, scheduler, virtual memory, drivers, and dispatcher. The main advantage of a monolithic kernel is performance due to faster system calls and direct hardware access. The main disadvantage of monolithic kernels is that if something crashes, it brings down the entire system.

   Microkernels are much more lightweight and handle process scheduling and memory. Many of the other functions run in the upper user privilege mode as separate user-space processes/services. This gives the user more flexibility when it comes to manipulating the

kernel. One advantage of microkernels is stability and reliability, as drivers and services are kept in the user space, meaning a buggy driver or crashing application won't bring down the entire system. One of the disadvantages is its complex design; separating everything adds complexity to OS design.

Hybrid kernels are a combination of both monolithic and micro, and they allow important functions to run in privileged kernel mode and other functions to run in user privilege mode. One of the advantages of a hybrid kernel is that it offers more flexibility when it comes to drivers and services being able to run in the user space. One of the disadvantages of a hybrid kernel is that it can potentially become unstable if too much is run in kernel mode.

4. Explain in writing what are processes, file systems, and architecture (3 part question)

   A process is a program that is executing and that's the operating system is managing.

   A File system is the logical structure and rules that an operating system use to organize store and manage data.

   Architecture is the design of the computing system. It covers the way hardware is used and connected, the instruction sets, and how software and hardware interact.

5. Explain in writing what the four main hardware components are in week 1

   RAM, Hard Disk, Logic Board and CPU

6. Discuss in writing the history of the Windows operating system

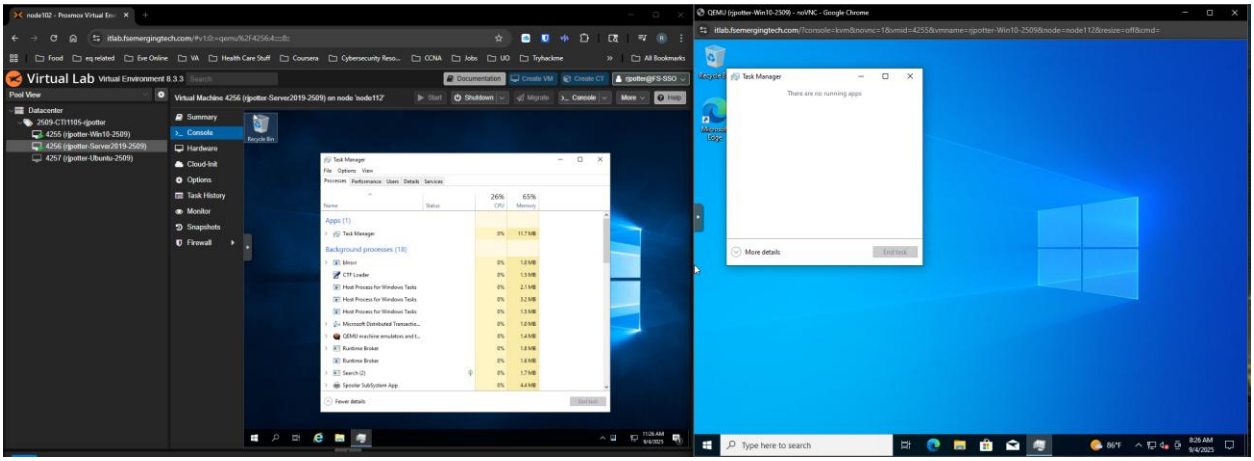
DOS was released in the 1980's as a closed source code. It was a single task kernel it could only do 1 task at a time. In 1985 Windows 1.0 was released as a GUI on top of MS Dos. In 1990 Windows 3.0 was released and was very successful. In 1995 Windows 95 was released that introduced the start button and taskbar and was the birth of the way windows looks today.

7. Explain in writing what roles and editions are in Windows Server 2019, whats the difference between the two?

   Datacenter, Standard

   The primary difference between the 2 versions is support for virtualization, software-defined networking, and storage technologies. Datacenter has unlimited Virtualization rights and has many advanced features like Shielded Virtual Machines, Storage Spaces Direct, and the Network Controller role. Standard can perform minimal virtualized Environments (2 VMS).

8 And 9. Screenshot accessing Windows 10 and Server 2019 virtual machines (logging in to each machine And Screenshot accessing the task manager in Windows 10 and Server 2019 (once logged in)


Virtual Lab
Virtual Machine 4256 (rjgotter-Server2019-2509) on node 'node112'
Summary
Console
Hardware
Cloud-Init
Options
Task History
Monitor
Snapshots
Firewall
Task Manager
There are no running apps
More details
End task
Type here to search

References:

Question 4 process :
https://www.google.com/search?q=what+is+a+process+computer+science&rlz=1C1RXQR_enUS1132US1132&oq=What+is+a+process+comp&gs_lcrp=EgZjaHJvbWUqBwgAEAAYgAQyBwgAEAAYgAQyBggBEEUYOTIICAIQABgWGB4yCAgDEAAYFhgeMggIBBAAGBYYHjIICAUQABgWGB4yCAgGEAAYFhgeMggIBxAAGBYYHjIICAgQABgWGB4yCAgJEAAYFhge0gEKMTY3NDRqMGoxNagCCLACAfEFtiPCa714rrPxBbYjwmu9eK6z&sourceid=chrome&ie=UTF-8

Question 4 File system:
https://www.google.com/search?q=what+is+a+file+system+computer+science&sca_esv=7550878c098e0420&rlz=1C1RXQR_enUS1132US1132&sxsrf=AE3TifO_xWZfkFr15ow-lKxPwiK5cNgPbw%3A1757000538913&ei=WrO5aIi_N9iUwbkPvcGnwQs&ved=0ahUKEwiI1PeHub-PAxVYSjABHb3gKbgQ4dUDCBE&uact=5&oq=what+is+a+file+system+computer+science&gs_lp=Egxnd3Mtd2l6LXNlcnAiJndoYXQgaXMgYSBmaWxlIHN5c3RlbSBjb21wdXRlciBzY2llbmNlMgYQABgHGB4yCxAAGIAEGIYDGIoFMgsQABiABBiGAxiKBTILEAAYgAQYhgMYigUyCBAAGIAEGKIEMggQABiiBBiJBUjpKVD0BVj5JHABeAGQAQCYAWugAdIKqgEEMTcuMbgBA8gBAPgBAZgCE6ACkgvCAgoQABiwAxjWBBhHwgIHECMYsAIYJ8ICCBAAGAcYCBgewgIFEAAYgATCAgYQABgIGB7CAgcQABiABBgNwgIIEAAYCBgNGB6YAwCIBgGQBgiSBwQxOC4xoAe3jwGyBwQxNy4xuAeNC8IHBjAuMTEuOMgHNg&sclient=gws-wiz-serp

Question 4 Architecture:

https://www.google.com/search?q=what+is+architecture+computer+science&sca_esv=7550878c098e0420&rlz=1C1RXQR_enUS1132US1132&sxsrf=AE3TifOwi7V6h3_Vo5jhF6fycThYOl_aFw%3A1757000708494&ei=BLS5aO_2HdeSwbkPnv-GsA0&ved=0ahUKEwjviObYub-PAxVXSTABHZ6_AdYQ4dUDCBE&uact=5&oq=what+is+architecture+computer+science&gs_lp=Egxnd3Mtd2l6LXNlcnAiJXdoYXQgaXMgYXJjaGl0ZWN0dXJlIGNvbXB1dGVyIHNjaWVuY2UyBhAAGAcYHjIGEAAYBxgeMgYQABgHGB4yBhAAGAgYHjIGEAAYCBgeMgYQABgIGB4yBhAAGAgYHjIGEAAYCBgeMgYQABgIGB4yBhAAGAgYHki_D1CuCFiuCHABeAGQAQCYAXegAXeqAQMwLjG4AQPIAQD4AQL4AQGYAgKgAoABwgIKEAAYsAMY1gQYR5gDAIgGAZAGCJIHAzEuMaAHnwmyBwMwLjG4B3vCBwMyLTLIBwc&sclient=gws-wiz-serp

Question 6:

https://www.google.com/search?q=the+history+of+the+Windows+operating+system&sca_esv=7550878c098e0420&rlz=1C1RXQR_enUS1132US1132&sxsrf=AE3TifOduJFs7V0PHjh_SvCUK9l4ZRnHvg%3A1757001149230&ei=vbW5aM7cDb62wt0PkKiEkAs&ved=0ahUKEwiOr_qqu7-PAxU-m7AFHRAUAbIQ4dUDCBE&uact=5&oq=the+history+of+the+Windows+operating+system

&gs_lp=Egxnd3Mtd2l6LXNlcnAiK3RoZSBoaXN0b3J5IG9mIHRoZSBXaW5kb3dzIG9wZXJhdGluZyBzeXN0ZW0yBhAAGAcYHjIGEAAYBxgeMgYQABgHGB4yCxAAGIAEGJECGIoFMgsQABiABBiGAxiKBTILEAAYgAQYhgMYigUyCxAAGIAEGIYDGIoFSMb0FVCu8hVYrvIVcAF4AZABAJgBa6ABa6oBAzAuMbgBA8gBAPgBAZgCAqACcCICChAAGLADGNYEGEeYAwCIBgGQBgiSBwMxLjGgB84GsgcDMC4xuAduwgcDMC4yyAcE&sclient=gws-wiz-serp

Question 7:

https://www.google.com/search?q=What+are+the+key+differences+between+windows+Server+2019+Datacenter%2C+Standard&sca_esv=7550878c098e0420&rlz=1C1RXQR_enUS1132US1132&sxsrf=AE3TifMM9jaKvDPQHAsW5YEoOyESCKpPbA%3A1757001608790&ei=iLe5aM_yL4yNwbkPqLOzkAY&ved=0ahUKEwjP1ouGvb-PAxWMRjABHajZDGIQ4dUDCBE&uact=5&oq=What+are+the+key+differences+between+windows+Server+2019+Datacenter%2C+Standard&gs_lp=Egxnd3Mtd2l6LXNlcnAiTVdoYXQgYXJlIHRoZSBrZXkgZGlmZmVyZW5jZXMgYmV0d2VlbiB3aW5kb3dzIFNlcnZlciAyMDE5IERhdGFjZW50ZXIsIFN0YW5kYXJkSKmVAVDnB1iOjAFwAXgBkAEAmAGWAaAB6CaqAQU0MC4xOLgBA8gBAPgBAfgBApgCOqACxifCAgoQABiwAxjWBBhHwgINEAAYgAQYsAMYQxiKBcICChAjGIAEGCcYigXCAgQQIxgnwgIKEAAYgAQYQxiKBcICCxAAGIAEGJECGIoFwgIWEC4YgAQYsQMY0QMYQxiDARjHARiKBcICEBAAGIAEGLEDGEMYgwEYigXCAg4QABiABBixAxiDARiKBcICCxAAGIAEGLEDGIMBwgIIEAAYgAQYsQPCAgUQABiABMICCBAuGIAEGLEDwgIEEAAYA8ICChAAGIAEGBQYhwLCAgUQLhiABMICCxAuGIAEGMcBGK8BwgIGEAAYFhgewgIIEAAYFhgKGB7CAgsQABiABBiGAxiKBcICBRAAGO8FwgIEAAYgAQYogTCAggQABiiBBiJBcICBRAhGKABwgIFECEYqwKYAwCIBgGQBgqSBwUzOS4xOaAHqvwDsgcFMzguMTm4B8InwgcGMC41Mi42yAeKAQ&sclient=gws-wiz-serp